

IMPERIAL BUREAU OF HORTICULTURE

AND PLANTATION CROPS,

EAST MALLING.

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THE IMPERIAL BUREAU OF FRUIT PRODUCTION

RECENT WORK OF TROPICAL AND SUB-TROPICAL INTEREST

THE realization of the growth in England of a highly developed fruit culture based on intensive research caused a demand among research workers in the tropics and sub-tropics for the development of similar research in their respective countries or spheres of activity. As the result of the enthusiasm of workers themselves, of their agricultural departments and of the Colonial Office a large number of agricultural officers have since 1929 paid visits varying from a week to six months to the East Malling Research Station either prior to taking up their appointments or during ordinary leave. They have come from India, Ceylon, Cyprus, Gambia, Gold Coast, Kenya, Malta, Mauritius, Nigeria, Palestine, Tanganyika, Trinidad and Uganda. Not only has it been possible during their visits to study the methods and technique adopted at East Malling, but also their attention has been drawn by the Bureau to the literature available and to actual work in progress in other parts of the world on the particular subjects with which they are or will be dealing in the tropics. On leaving the Research Station they know that they can write both to particular workers at East Malling on points of technique adopted and also to the Bureau to be kept up to date on current research methods elsewhere. The contacts made by these visits have in all cases been kept.

The Bureau staff has taken every possible chance of familiarizing itself with tropical and sub-tropical crops and conditions. The Director in his 1931 tour of Canada, New Zealand and Australia went out of his way to visit the fruit areas of Queensland, to appreciate by personal observation the problems confronting the tea grower in Ceylon and to understand something of the specialized and highly successful horticultural organization of Java and the Dutch East Indies. The Chief Officer has established close touch with the increasingly important fruit research work in Italy, being sent in 1932 on a special visit of investigation to the citrus districts in the South and to the now flourishing research station at Acireale in Sicily. Mr. Feilden has had long personal experience of tropical fruits, and in 1935 Mr. Argles, late of the Imperial College of Tropical Agriculture, Trinidad, and of Palestine, joined the staff.

The commonest request in the early days of the Bureau was for advice on the layout of experimental plots. Long experience had shown that any advice must essentially depend, other things being equal, on the degree of uniformity of the material to be investigated. Accordingly the statistician of the East Malling Station, Mr. T. N. Hoblyn, having been primarily responsible for adapting R. A. Fisher's ideas to the needs of horticulture, was induced to collect into the compass of the Bureau's first printed technical communication (Technical Communication No. 2) present knowledge on the layout of field experiments in horticulture and to devote a special section therein to the difficulties peculiar to the tropics. In this work the desirability of using uniform material becomes ever more apparent. Unfortunately the tropical worker's observations on his material have almost always shown him that it is extremely mixed, uncertain in performance and quite unsuitable for experimental work. In order, therefore, that the possibility of working with uniform material might soon be available to even the least favourably situated Colony, the Bureau decided to follow up Technical Communication No. 2 with technical

communications on the vegetative propagation of perennial tropical and sub-tropical crops, especially fruit crops. Accordingly a start was made with citrus and Technical Communication No. 3 was issued on the subject of the standardization of citrus trees by propagation methods. At the present time, October, 1935, considerable material has been assembled for a further technical communication to deal with the vegetative propagation of a large number of other tropical fruits. This will appear very shortly and should at least pave the way for obtaining standardized material for experimental work and so for adequate experiments on crops which have hitherto not received attention or have yielded negative or conflicting results.

It may be interesting to consider a few of the queries from the tropics to which it has been the lot of the Bureau to reply. They have varied from a short card asking for the address of a nurseryman or a manufacturer to a two page letter, each line of which contained a query, desiring full information on fruit growing, horticulture and allied subjects including storage, preservation and genetics. Finally, in case Satan might still find work for idle hands, came the demand for full notes on "any other aspects of tropical interest". It is regretted that the Bureau's reply was not quite so full as it would have wished.

Citriculture was responsible for numerous queries. Thus five separate bibliographies on different phases of citriculture were sent to India and to other tropical countries. Information was afforded to the Office of H.M. East African Dependencies and the Colonial Office with regard to the identity, source and value of different citrus varieties. The layout of citrus experimental plots formed the subject of enquiries from several countries, notably India, Palestine, Tanganyika and the West Indies, while propagation of citrus was dealt with not only in the technical communication mentioned above but separately also in the case of Uganda and other colonies. The effect of climate on coconut growing was the subject of an enquiry from Kenya, while Fiji was interested in coconut pests. Queries on coffee from Kenya, Northern Rhodesia and Tanganyika concerned fermentation processes, manuring, and rootgrowth as affecting transplanting respectively. Deciduous fruit growing in the highlands of the tropics has formed the subject of several interesting enquiries, while a correspondent in Kenya was helped in his attempts to find a satisfactory method of storing potatoes in the tropics. The Bureau's contact with Ceylon has been constant through the search for knowledge of the Tea Research Institute at St. Coombs. Service rendered here has included translations from German and Italian on wood preservatives and on mulberries, searching for, finding and copying an article from an old number of a French journal available neither in this country nor in Ceylon, information on minor points of the technique of vegetative propagation, and making enquiries and having estimates submitted from reputable firms for photostat reproduction of the Institute's publications. Other queries on propagation have concerned cacao, coffee, mangoes and rubber and have originated in Assam, Uganda, Nigeria, Antigua and Malaya. Apart from advice on citrus plot layout the East Malling statistician has been called into consultation regarding the layout of experiment plots for a number of other tropical crops, including coffee in Northern Rhodesia. The references, literature and subsidiary information have in all such cases been supplied by the Bureau.

It has apparently been difficult in the past for workers in the tropics to know exactly where else in the world, especially outside the Empire, research work is in progress on particular problems. Gradually a fair amount of information has been amassed on this all important point. Thus the research work of a horticultural nature in the greater part of Africa and how results are published are now known to the Bureau.

Translations have been in request from many quarters, frequently of articles, the abstracts of which in Horticultural Abstracts have inspired the desire for the full story. Translations of varying length have been supplied at different times to Assam, Ceylon, Nigeria, Tanganyika and Uganda, the original languages concerned being Dutch, Italian, German and Russian.

There has been a pretty steady demand for references on different aspects of crop work in the tropics, thus bibliographies on several phases of coffee growing have been sent to Kenya, on literature dealing with tropical crops to Fiji, and on the C/N ration in plants to Assam and Tanganyika. In most cases, moreover, the answers sent to queries have included pertinent references sometimes amounting to a mere half dozen at others to a hundred and more.

Equipment for the laboratory and for the field has been the subject of numerous enquiries. Notes on laboratory equipment and sources of supply have been sent to Tanganyika, while an early query from Uganda concerned the type of container suitable for carriage of citrus essential oils. A similar type of query was recently received from Kenya, the requirement here being suitable lining material for fruit juice containers and sources thereof. The source of labels for field use and the composition of grafting wax formed the subject of an enquiry from Nigeria. Marketing problems lie outside the Bureau's sphere, but even here the commercial contacts which the Research Station has with London salesmen have often been helpful to the Bureau's correspondents, as for instance to an Indian department interested in banana figs.

Yet at the present day undoubtedly the work in which the Bureau Officers are chiefly concerned is the compilation of Horticultural Abstracts. The total number of abstracts have risen from 428 in 1931 to 696 in 1934. Special sections have been devoted to citrus and tropical crops and on the average some 35% of all abstracts published have dealt with these crops. Some eighty separate tropical crops have formed the subject of abstracts, and of these citrus, including oranges, lemons, grapefruit, essential oils, etc., has been predominant with 212 abstracts, being followed by rubber 67, tea 64, cacao 52, bananas 49, coffee 42, coconuts 27, avocados 22, olives 20, pineapples 18, mangoes 15. Propagation of tropical crops has been dealt with in some 75 abstracts, storage in 22, root growth in 15. Each year the abstracts are indexed and the index forms a quick and is beginning to form a comprehensive source of information of modern work on the more important perennial tropical crops.

Abstracts cannot hope to be an adequate substitute for important original articles, consequently they have fairly often elicited requests for fuller abstracts or for the original article itself with or without translation. In the latter case the Bureau has not normally sent out its own and almost certainly only copy, but has ordered the particular periodical to be sent direct or has written to the writer of the article asking him to send a copy. This request has hitherto always been granted and often contact has thereby been established between two workers on the same subject in different parts of the world to their mutual benefit.

In brief the Bureau would appear to be affording a not unneeded link between individual horticultural research workers in different parts of the Empire and other workers, Imperial and Foreign, both in and outside the tropics.

